



# New record of *Euphorbia thymifolia* L. (Euphorbiaceae) from the state of Acre, Brazil

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## Abstract

*Euphorbia thymifolia* L. (Euphorbiaceae) is a prostrate herb distinguished from similar species by the combination of serrate leaf margin, puberulous ovary and fruit with capitate styles and pedicel not accrescent in fruit and breaching the involucre of the cyathia during maturation. In this paper we present the first record of *E. thymifolia* for the state of Acre, in Alto Juruá region, municipality of Cruzeiro do Sul, in a residential sidewalk crack habitat (07.6161°S, 072.6872°W). We also comment on its habitat and distribution, and include comparisons with commonly misidentified related species.

## Keywords

Alto Juruá, flora, prostrate herb, taxonomy

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## Introduction

Euphorbiaceae is one of the most expressive flora families in the Brazilian Amazon (BFG 2015). Ricardo Secco's studies of this family have stood out since the eighties (Secco 1987, 1990, Secco et al. 2012; Costa et al. 2018; among others). Such studies found that the Amazon constitutes a diversity center of many genera (Bigio and Secco 2011, 2012; Souza and Secco 2014), some of which are endemic (e.g., *Micrandropsis* W.A. Rodrigues and *Sandwithia* Lanj.) and others have few specimens available in herbaria (e.g., *Angostylis* Benth. and *Astrococcus* Benth.). However, most of these studies have prioritized trees and lianas (Souza et al. 2014; Secco and Bigio 2017; Costa et al. 2018; Secco et al. 2019), and little attention

has been given to herbaceous plants, even though they are common. Such conduct is also observed in other families in the mentioned bioma (Souza et al. 2020).

For instance, in the state of Amazonas, 54 species and 33 genera of Euphorbiaceae were recorded (Ribeiro et al. 1999), among which only four genera and eight species are herbaceous plants. For the state of Acre, the results were not different. Out of 37 genera and 98 species recorded, four genera and seven species refer to herbs (Daly and Silveira 2008; Medeiros et al. 2014).

In this context, the genus *Euphorbia* L. stands out, as it is the most diverse genus of Euphorbiaceae, with approximately 2,000 species, occurring in tropics and



subtropics (Webster 2014). Most of its representatives have herbaceous habits, and its ruderal species are common in the Amazon. However, the local records of such species are rare and old, and many of them have been misidentified (Ribeiro et al. 1999). Such is the case of *Euphorbia thymifolia* L., which has been mistaken for *E. prostrata* Aiton and *E. hyssopifolia* L., among others (Silva et al. 2014).

From Acre state, Daly and Silveira (2008) recorded three species of *Euphorbia* of herbaceous habit, *E. hirta* L., *E. sinclairiana* Benth (name presently accepted for *E. capansa* Ducke) and *E. capitellata* Engelm. Besides the already mentioned names, there are only two more names (*E. lasiocarpa* Klotzsch, e *E. hyssopifolia* L.) in Re flora virtual herbarium (Flora do Brasil 2020).

For *E. capitellata*, the collection (*M. Urquia* 188) referred to by Daly and Silveira (2008) was not found in virtual herbaria. Therefore, it was not possible to examine it. However, we strongly believe that this represents a misidentification, as *E. capitellata* only occurs in the southern USA and in northern Mexico (Yang 2014).

In this paper we present a new record of *Euphorbia* from Acre state. It is *Euphorbia thymifolia*, a ruderal plant of herbaceous habit, collected in the Alto Juruá region in the westernmost area of Brazil.

## Methods

The botanical material was collected in sidewalk crack, near the residence of the first author, in Formoso, municipality of Cruzeiro do Sul (07°36'58"S, 072°41'14"W, WGS84), as part of the Project Flora do Alto Juruá. The identification of the species was based on the taxonomic treatment of *Euphorbia* for the state of São Paulo (Silva et al. 2014), which includes all ruderal species found in Brazil. The identification was also made by comparison with images and data available via Tropicos.org (2020), SpeciesLink (2020), and Flora do Brasil (2020). The specimens were deposited in the Campus Floresta Herbarium (CFCZS) of the Universidade Federal do Acre according to usual procedures for Plant Systematics (Bridson and Forman 1998). Herbaria acronyms follow the standards of Holmgreen et al. (1990).

Given the common misidentification of specimens of *Euphorbia thymifolia*, the geographical distribution of *Euphorbia thymifolia* in Brazil (Fig. 1) is based on occurrences gathered only from selected herbaria (ALCB, ASE, BHCB, BOTY, CEN, CEPEC, CESJ, CGMS, ESA, HRCB, HUEFS, HUEM, IAC, JPB, MAC, MBM, PEUFR, R, RB, SP, SPF, UB, UEC, UFP, UFRN) visited by the authors of this paper, available in Re flora virtual herbarium (Flora do Brasil 2020) and the SpeciesLink database (SpeciesLink 2020). When coordinates could not be retrieved directly from these databases, we searched for approximate coordinates in Google Maps. We provided a complete list of vouchers included for the distribution map (Table 1).

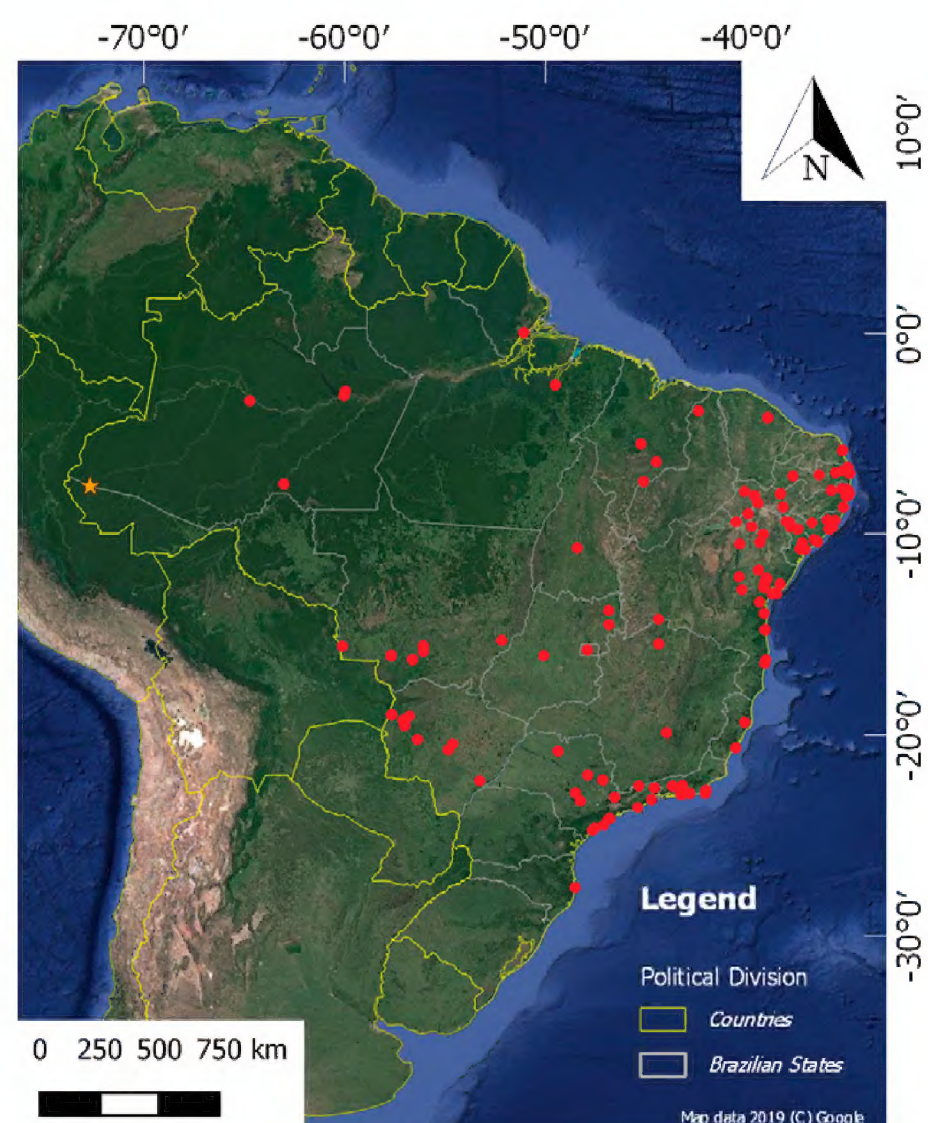
## Results

### *Euphorbia thymifolia* L.

Sp. Pl.: 454. 1753 (Linnaeus 1753). Lectotype (designated by Wheeler 1941): Locality unknown, *Anonymous s.n.* (LINN 630.10!). *Chamaesyce thymifolia* (L.) Millsp., Publ. Field Columb. Mus., Bot. Ser. 2: 412. 1916 (Millspaugh 1916).

**New record.** BRAZIL • Acre state, Alto Juruá region, Cruzeiro do Sul, Formoso District (Fig. 1), collected in a sidewalk crack of a residential garden, exposed to sunlight; 07.6161°S, 072.6872°W (WGS84); 30 May 2020, Souza MC 793 leg.; CFCZS 1214 (Fig. 2I, J).

**Identification.** Prostrate herb, branches reaching up to 0.2 m; latex abundant, milky. Stems reddish, glabrous on the lower surface and pubescent on the upper surface. Leaves opposite, subsessile, petioles 0.3–0.8 mm long; stipules foliaceous, interpetiolar; blade sometimes reddish, elliptic to oval, 5–7 × 3–4 mm, base asymmetric, apex rounded, margin serrate, glabrous to sparsely pilose; venation actinodromous. Cyathia axillary, solitary or in pairs; involucre turbinate, 0.8–1 × 0.3–0.5 mm, pubescent on the outer surface; cyathial glands 4, ellipsoid, red, appendages absent or poorly developed, sometimes unequal in size (2 of them slightly larger). Staminate flowers with yellow to pinkish anthers. Pistillate flower lacking a perianth-like whorl; ovary pinkish, puberulous; styles red, bifid, and capitate at the apex. Fruits with pedicel not accrescent (so the fruit splits the involucre during maturation), puberulous; seeds 4-gonous in



**Figure 1.** Geographical distribution of *Euphorbia thymifolia* based on selected occurrences retrieved from Re flora Virtual Herbarium and SpeciesLink databases (red circles). The new record is indicated as an orange star.



**Table 1.** List of occurrences of *Euphorbia thymifolia* in Brazil, with voucher, locality and latitude and longitude coordinates in decimal degrees.

| Voucher                               | Locality                           | Latitude  | Longitude |
|---------------------------------------|------------------------------------|-----------|-----------|
| M.C.Souza 793 (CFCZS)                 | Acre, Cruzeiro do Sul (new record) | −07.6161  | −072.6872 |
| R.P. Lyra-0Lemos 10701 (MAC)          | Alagoas, Delmiro Gouveia           | −09.3796  | −038.0007 |
| C.R. Campêlo 1802 (UEC)               | Alagoas, Maceió                    | −09.6658  | −035.7352 |
| Chagas-0Mota 2786 (MAC)               | Alagoas, Maceió                    | −09.6498  | −035.7089 |
| Chagas-0Mota 2859 (MAC)               | Alagoas, Maceió                    | −09.6498  | −035.7089 |
| R.P. Lyra-0Lemos 7638 (MAC)           | Alagoas, Maceió                    | −09.5542  | −035.7754 |
| S.A. Martins s.n. (MAC 26221)         | Alagoas, Maceió                    | −09.5542  | −035.7754 |
| D. Navarro s.n. (MAC 10128)           | Alagoas, Maceió                    | −09.6498  | −035.7089 |
| M.N. Rodrigues 491 (MAC)              | Alagoas, Marechal Deodoro          | −09.7695  | −035.8608 |
| A.I.L. Pinheiro 908 (MAC)             | Alagoas, Marechal Deodoro          | −09.7708  | −035.8403 |
| Chagas-0Mota 1733 (MAC)               | Alagoas, Marechal Deodoro          | −09.7695  | −035.8608 |
| A.I.L. Pinheiro 442 (MAC)             | Alagoas, Murici                    | −09.3099  | −035.9418 |
| A.I.L. Pinheiro 522 (MAC)             | Alagoas, Murici                    | −09.3099  | −035.9418 |
| M.N. Rodrigues 284 (MAC)              | Alagoas, Olho D'Água do Casado     | −09.4229  | −037.8300 |
| R.P. Lyra-0Lemos 10275 (MAC)          | Alagoas, Pão de Açúcar             | −09.7493  | −037.4517 |
| E. Melo 12385 (HUEFS)                 | Alagoas, Pão de Açúcar             | −09.7594  | −037.4108 |
| M.N. Rodrigues 570 (MAC)              | Alagoas, Piaçabuçu                 | −10.4073  | −036.4313 |
| L. Nusbaumer 4543 (MAC)               | Alagoas, Quebrangulo               | −09.4401  | −036.7157 |
| R.P. Lyra-0Lemos 10890 (MAC)          | Alagoas, São Luiz do Quitunde      | −09.3186  | −035.5608 |
| D.F. Austin 7433 (UEC, RB)            | Amapá, Macapá                      | 00.0335   | −051.0703 |
| M.A.S. Costa 258 (RB)                 | Amazonas, Amazonas                 | −02.8830  | −059.9666 |
| F.N. Chagas 197 (UEC, BOTU)           | Amazonas, Humaitá                  | −07.5061  | −063.0208 |
| S.G.A. Sousa s.n. (ESA 33343)         | Amazonas, Manaus                   | −03.1019  | −060.0250 |
| P.L.K. 12023 (RB)                     | Amazonas, Tefé                     | −03.3667  | −064.7191 |
| Grupo Pedra do Cavalo 139 (ALCB)      | Bahia, Cachoeira                   | −012.5333 | −039.0833 |
| A.M. A. Amorim 3810 (SPF)             | Bahia, Cachoeira                   | −012.5333 | −039.0833 |
| Pirajá da Silva s.n. (SP 39332)       | Bahia, Camamú                      | −013.9447 | −039.1039 |
| G. Fotius 3969 (HUEFS)                | Bahia, Campo Formoso               | −10.5074  | −040.3219 |
| G.C.P. Pinto 42323 (ALCB)             | Bahia, Cruz das Almas              | −12.6666  | −039.1000 |
| G.C.P. Pinto 52-0215 (ALCB)           | Bahia, Cruz das Almas              | −12.6666  | −039.1000 |
| G. Fotius 3350 (HUEFS)                | Bahia, Curaçá                      | −08.9951  | −039.9026 |
| A.M. Giulietti 1723 (CEPEC)           | Bahia, Euclides da Cunha           | −10.0327  | −039.1500 |
| J.G. Jardim 3595 (ALCB, CEPEC, HUEFS) | Bahia, Feira da Mata               | −14.2511  | −044.3694 |
| N.R.S. Conegundes 3 (HUEFS)           | Bahia, Feira de Santana            | −12.2027  | −038.9713 |
| L.R. Noblick 2556 (CEPEC)             | Bahia, Feira de Santana            | −12.4930  | −038.3130 |
| L.R. Noblick 2611 (CEPEC)             | Bahia, Feira de Santana            | −12.2500  | −038.9666 |
| E. Melo 13254 (HUEFS)                 | Bahia, Feira de Santana            | −12.2530  | −039.0336 |
| F. França 2302 (ESA, MAC)             | Bahia, Iaçú                        | −12.7672  | −040.2117 |
| J.L. Hage 1747 (CEPEC)                | Bahia, Ilhéus                      | −14.7889  | −039.0494 |
| J.L. Hage 1748 (CEPEC)                | Bahia, Ilhéus                      | −14.7889  | −039.0494 |
| J.L. Hage 1904 (CEPEC, MBM, SP)       | Bahia, Ilhéus                      | −14.7889  | −039.0494 |
| W.W. Thomas 9643 (CEPEC)              | Bahia, Juazeiro                    | −09.4000  | −040.5000 |
| A.L. Costa s.n. (ALCB 2190)           | Bahia, Juazeiro                    | −09.4000  | −040.5000 |
| F. Glausser 1004 (SPSF)               | Bahia, Macajuba                    | −12.1410  | −040.3604 |
| M.L. Guedes 12150 (CEPEC)             | Bahia, Monte Santo                 | −10.4333  | −039.3166 |
| A.M. Carvalho 1324 (CEPEC)            | Bahia, Porto Seguro                | −16.4496  | −039.0647 |
| M.L. Guedes 17389 (ALCB)              | Bahia, Presidente Tancredo Neves   | −13.3836  | −039.3300 |
| A.M. Carvalho 2760 (CEPEC)            | Bahia, Riachão do Jacuípe          | −11.8069  | −039.3856 |
| G.S. Campos 103 (ALCB)                | Bahia, Salvador                    | −12.9333  | −038.5166 |
| L.R. Noblick 1030 (ALCB)              | Bahia, Salvador                    | −12.9666  | −038.5000 |
| L.R. Noblick 1051 (ALCB)              | Bahia, Salvador                    | −12.9666  | −038.5000 |
| L.R. Noblick 1683 (ALCB)              | Bahia, Salvador                    | −12.9666  | −038.5000 |
| A.L. Costa s.n. (ALCB 2187)           | Bahia, Salvador                    | −12.9666  | −038.5000 |
| A.L. Costa s.n. (ALCB 2188)           | Bahia, Salvador                    | −12.9666  | −038.5000 |
| A.L. Costa s.n. (ALCB 2199)           | Bahia, Salvador                    | −12.9666  | −038.5000 |
| Britto de Azevedo s.n. (ALCB 2206)    | Bahia, Salvador                    | −12.9666  | −038.5000 |
| L.M. Pacheco 110 (ALCB)               | Bahia, Santa Cruz Cabralia         | −16.2666  | −039.0166 |
| M.V. Moraes 497 (HUEFS)               | Bahia, Vera Cruz                   | −12.9833  | −038.7000 |
| J.E. Leite 765 (RB)                   | Ceará                              | −04.2085  | −038.9264 |
| J.E. Leite 770 (RB)                   | Ceará                              | −04.2085  | −038.9264 |



| Voucher                           | Locality                               | Latitude  | Longitude |
|-----------------------------------|--|-----------|-----------|
| José Eugênio 765 (RB)             | Ceará                                  | −04.2085  | −038.9264 |
| José Eugênio 770 (RB)             | Ceará                                  | −04.2085  | −038.9264 |
| L. Krieger s.n. (CESJ 19606)      | Espírito Santo, Guarapari              | −020.6580 | −040.5110 |
| D.A. Folli 2584 (CVRD)            | Espírito Santo, Linhares               | −019.3911 | −040.0722 |
| A.C. Sevilha 3237 (CEN)           | Goiás, Alvorada do Norte               | −014.5216 | −046.8375 |
| J.E.C. Júnio 9 (UFG)              | Goiás, Mossâmedes                      | −016.0713 | −050.0884 |
| M. Aparecida da Silva 4326 (SP)   | Goiás, Nova Roma                       | −013.8055 | −046.8472 |
| L.P. Félix 8053 (UEC)             | Maranhão, Aldeia                       | −06.4135  | −044.4781 |
| G. Eiten 10313 (SP)               | Maranhão, Barra do Corda               | −05.5166  | −045.2500 |
| G. Eiten 4007 (SP)                | Maranhão, Loreto                       | −07.3833  | −045.1166 |
| M.P. Fachini 498 (HUEM)           | Mato Grosso do Sul, Batayporã          | −022.2953 | −053.2710 |
| E.F. Nienstedt 271 (RB)           | Mato Grosso do Sul, Campo Grande       | −020.4669 | −054.6200 |
| I.P.P. Araújo 9 (CGMS)            | Mato Grosso do Sul, Corumbá            | −019.5772 | −057.0166 |
| F. Bao 64 (CGMS)                  | Mato Grosso do Sul, Corumbá            | −019.5027 | −057.0166 |
| A.C. Allem 118 (CEN)              | Mato Grosso do Sul, Corumbá            | −019.0091 | −057.6533 |
| F.S. Carvalho 119 (CGMS)          | Mato Grosso do Sul, Corumbá            | −019.0622 | −056.7669 |
| E. Pereira 203 (RB)               | Mato Grosso do Sul, Corumbá            | −019.0098 | −057.6490 |
| L.C.S. Magalhães 475 (CGMS)       | Mato Grosso do Sul, Corumbá            | −019.4855 | −057.0166 |
| A.C. Allem 1231 (CEN)             | Mato Grosso do Sul, Corumbá            | −019.0091 | −057.6533 |
| A.C. Allem 1408 (CEN)             | Mato Grosso do Sul, Corumbá            | −019.0091 | −057.6533 |
| G. Hatschbach 60917 (MBM)         | Mato Grosso do Sul, Corumbá            | −019.0098 | −057.6490 |
| U.M. Resende 324 (CGMS)           | Mato Grosso do Sul, Miranda            | −020.2406 | −056.3783 |
| J.D.S.P. Bento 53 (CGMS)          | Mato Grosso do Sul, Pantanal           | −019.2890 | −057.0821 |
| A. Guglieri 1653 (CGMS)           | Mato Grosso do Sul, Sidrolândia        | −020.7627 | −054.8369 |
| G. Eiten 9710 (SP)                | Mato Grosso, Barra do Garças           | −015.3106 | −052.1750 |
| A.C. Allem 748 (CEN)              | Mato Grosso, Cáceres                   | −016.0706 | −057.6789 |
| A.C. Allem 752 (SP)               | Mato Grosso, Cáceres                   | −016.0706 | −057.6789 |
| M.A. Carniello 1030 (HRCB)        | Mato Grosso, Cáceres                   | −016.0680 | −057.6832 |
| M.A. Carniello 1031 (HRCB)        | Mato Grosso, Cáceres                   | −016.0680 | −057.6832 |
| M.A. Carniello 1032 (HRCB)        | Mato Grosso, Cáceres                   | −016.0680 | −057.6832 |
| A.C. Allem 2397 (CEN, SP)         | Mato Grosso, Cáceres                   | −016.0706 | −057.6789 |
| G. Hatschbach 37498 (MBM)         | Mato Grosso, Cuiabá                    | −015.5829 | −056.0901 |
| J.S. Costa 1232 (RB)              | Mato Grosso, Mato Grosso               | −015.5997 | −060.1166 |
| A.L. Prado 3428 (UEC)             | Mato Grosso, Poconé                    | −016.2567 | −056.6227 |
| A.L. Prado 3653 (UEC)             | Mato Grosso, Poconé                    | −016.2567 | −056.6227 |
| M.C.M. Amarozo 379 (HRCB)         | Mato Grosso, Santo Antonio do Leverger | −015.8656 | −056.0766 |
| J.A. Lombardi 2573 (MBM)          | Minas Gerais, Belo Horizonte           | −019.9098 | −043.9678 |
| L. Krieger s.n. (CESJ 16112)      | Minas Gerais, Januária                 | −015.4881 | −044.3616 |
| R.C. Mota 4026 (BHCB)             | Minas Gerais, Jequitaiá                | −044.5627 | −017.0888 |
| M. Almeida s.n. (SP 31834)        | Pará, Mocajuba                         | −02.5841  | −049.5071 |
| J. Deslandes s.n. (SP, IAC 48848) | Paraíba, Alagoinha                     | −06.9500  | −035.5449 |
| O.T Moura 457 (JPB)               | Paraíba, Baía da Traição               | −06.6883  | −034.9357 |
| A.F. Pontes 463 (JPB)             | Paraíba, Cabedelo                      | −06.9811  | −034.8338 |
| V.C. Souza 26587 (ESA)            | Paraíba, Mamanguape                    | −06.8386  | −035.1260 |
| M. Sales 54 (PEUFR)               | Paraíba, Soledade                      | −07.0572  | −036.3628 |
| A.P. Fontana 9036 (RB)            | Pernambuco, Cabrobó                    | −08.4477  | −039.4152 |
| D.G. Oliveira 1129 (RB)           | Pernambuco, Floresta                   | −08.6483  | −038.1544 |
| A. Melquiados 50 (UFP)            | Pernambuco, Igarassu                   | −07.8341  | −034.9063 |
| A. Melo 65 (UFP)                  | Pernambuco, Igarassu                   | −07.7883  | −035.0155 |
| D. Araújo 293 (UFP)               | Pernambuco, Igarassu                   | −07.7802  | −035.0152 |
| D. Araújo 522 (UFP)               | Pernambuco, Igarassu                   | −07.8375  | −035.0027 |
| M.V. Alves 1558 (SP)              | Pernambuco, Jaboatão dos Guararapes    | −08.1127  | −035.0147 |
| J.C. Moraes 1283 (SPSF)           | Pernambuco, Nazaré da Mata             | −07.7428  | −035.2272 |
| R.M. Harley 54316 (CEPEC)         | Pernambuco, orocó                      | −09.6366  | −039.7138 |
| E.P. Heringer 510 (RB)            | Pernambuco, Ouricuri                   | −07.8838  | −040.0828 |
| F. Araújo 24 (PEUFR)              | Pernambuco, Parnamirim                 | −08.0905  | −039.5783 |
| F. Araújo 144 (PEUFR)             | Pernambuco, Parnamirim                 | −08.0905  | −039.5783 |
| A. Silva 9 (MBM)                  | Pernambuco, Paulista                   | −07.9408  | −034.8731 |
| A. Sarmiento s.n. (PEUFR 103)     | Pernambuco, Paulista                   | −07.9408  | −034.8731 |
| A. Lima s.n. (PEUFR 1416)         | Pernambuco, Recife                     | −08.0538  | −034.8811 |
| J.I. Falcão 796 (RB)              | Pernambuco, Rio Formoso                | −08.6628  | −035.1539 |
| E.P. Heringer 9 (RB)              | Pernambuco, Serra Talhada              | −07.9911  | −038.2893 |



| Voucher                          | Locality                                    | Latitude | Longitude |
|----------------------------------|---|----------|-----------|
| E.P. Heringer s.n. (PEUFR 5574)  | Pernambuco, Serra Talhada                   | −07.9911 | −038.2893 |
| L.P. Xavier s.n. (JPB 470)       | Pernambuco, Surubim                         | −07.8330 | −035.7547 |
| E.A. Franco 5 (HUEFS)            | Piauí, Esperantina                          | −03.8633 | −042.3788 |
| R.S. Fernandes 25 (RB)           | Rio de Janeiro, Cabo Frio                   | −22.9102 | −042.0347 |
| L.J.S. Pinto 1879 (RB)           | Rio de Janeiro, Cabo Frio                   | −22.7538 | −041.9969 |
| A.F.M. Glaziou s.n. (R 99135)    | Rio de Janeiro, Cabo Frio                   | −22.8647 | −042.0177 |
| A. Guinena s.n. (SP 99997)       | Rio de Janeiro, Duque de Caxias             | −22.7856 | −043.3116 |
| L.J.S. Pinto 96 (RB)             | Rio de Janeiro, Engenheiro Paulo de Frontin | −22.5495 | −043.6771 |
| D. Nunes 86 (RB)                 | Rio de Janeiro, Maricá                      | −22.9102 | −042.8191 |
| D.N.S. Machado 97 (RB)           | Rio de Janeiro, Maricá                      | −22.9156 | −042.8184 |
| L.C. Giordano 1068 (RB)          | Rio de Janeiro, Parati                      | −23.2216 | −044.7203 |
| O.C. Goés 164 (RB)               | Rio de Janeiro, Petrópolis                  | −22.5132 | −043.1793 |
| C.H.R. de Paula 293 (RB)         | Rio de Janeiro, Rio de Janeiro              | −22.9714 | −043.2107 |
| E. Pereira 4326 (RB)             | Rio de Janeiro, Rio de Janeiro              | −22.9734 | −043.2495 |
| D. Constantino s.n. (RB 35763)   | Rio de Janeiro, Rio de Janeiro              | −22.9670 | −043.2226 |
| R.S. Melo 19 (UFRN)              | Rio Grande do Norte, Natal                  | −05.8411 | −035.1987 |
| V.P. Moreira 284 (UFRN)          | Rio Grande do Norte, Natal                  | −05.8480 | −035.2011 |
| R.T. Queiroz 204 (UFRN)          | Rio Grande do Norte, Serra Negra do Norte   | −07.1086 | −037.6677 |
| O.L.M. Silva 46 (SP)             | São Paulo, Angatuba                         | −23.2946 | −048.2510 |
| M. Kuhlmann s.n. (SP 31263)      | São Paulo, Atibaia                          | −23.1100 | −046.5499 |
| O.L.M. Silva 84 (SP)             | São Paulo, Botucatu                         | −22.8873 | −048.4958 |
| A. Custódio Filho 1403 (SP)      | São Paulo, Caraguatatuba                    | −23.6200 | −045.4100 |
| O.L.M. Silva 35 (SP)             | São Paulo, Eldorado                         | −24.5264 | −047.1082 |
| O.L.M. Silva 26 (SP)             | São Paulo, Iguape                           | −24.6659 | −047.5474 |
| O.L.M. Silva 28 (SP)             | São Paulo, Iguape                           | −24.7713 | −047.6526 |
| O.L.M. Silva 38 (SP)             | São Paulo, Itanhaém                         | −24.2359 | −046.8753 |
| S.S. Socchi s.n. (ESA 2982)      | São Paulo, Itanhaém                         | −24.1800 | −046.7799 |
| O.L.M. Silva 16 (SP)             | São Paulo, Mogi Guaçu                       | −22.2506 | −047.1402 |
| J.R. Barban 11617 (UEC)          | São Paulo, São Carlos                       | −22.0100 | −047.8899 |
| O.L.M. Silva 64 (SP)             | São Paulo, São José do Barreiro             | −22.6458 | −044.5778 |
| M.A. Coleman 141B (SP)           | São Paulo, São José do Rio Preto            | −20.8200 | −049.3699 |
| O.L.M. Silva 21 (SP)             | São Paulo, Tremembé                         | −22.5408 | −045.3529 |
| E.C.A. Matos 16 (ASE)            | Sergipe, Areia Branca                       | −10.7580 | −037.3150 |
| A.C.C. Silva 11 (ASE)            | Sergipe, Canindé de São Francisco           | −09.6600 | −037.7891 |
| A.C.C. Silva 91 (ASE)            | Sergipe, Canindé de São Francisco           | −09.6600 | −037.7891 |
| M. Landim 684 (ASE)              | Sergipe, Itabaiana                          | −10.4583 | −037.2081 |
| A.P. Prata 2206 (ASE)            | Sergipe, Santana do São Francisco           | −10.2911 | −036.6077 |
| J.E. Nascimento Júnior 897 (ASE) | Sergipe, Santo Amaro das Brotas             | −10.7891 | −037.0541 |
| A.L. Costa s.n. (ALCB 2189)      | Tocantins, Porto Nacional                   | −10.7042 | −048.4130 |
| A.C. Allem 769 (CEN)             | Distrito Federal, Brasília                  | −15.7875 | −047.9136 |
| G. Hassemer 612 (FLOR)           | Santa Catarina, Florianópolis               | −27.6003 | −048.5207 |

cross section, light brown to pinkish, testa with 2–4 regular transversal ridges, ecarunculate.

**Additional specimens examined.** BRAZIL • Amazonas: Santa Isabel do Rio Negro, Rio Uneiuxi, Makú Indian village, 300 km, above mouth; forest on terra firme; 24 Oct. 1971; Prance GT 15595 (INPA 33812, US 2708630) • Amazonas: gardens around Jaradá, Rio Cuieiras; 17 Sept. 1973; Prance GT 18021 (INPA 41325) • Mato Grosso: Cacéres, dirt road; 17 Dec. 1976; Allen A 752 (CEN 748) • Amazonas: Manaus, Rua Lobo d’Almada, amidst the paving stones; 5 July 1971; Maas PJM 338 (INPA 34888) • Amazonas: Manaus, Campus do INPA, estrada do Aleixo, km 4, secondary forest of clay soil; 1 July 1975; Lisbôa PLB 149 (INPA 50804) • Amazonas: Manaus, 8 Tr. A, Jardim Haydea; prostrate weed in garden; 19 Sept. 1980; Lowe J 3983 (INPA 99317) • Amazonas: Humaitá, entry of igarapé do Puruzinho; 5 Aug. 1976; Chagas FN, Garcia JP, Alves NR 197 (UEC 46299)

• Amapá: areas neighboring Araxá beach, SE de Macapá, Araxá beach; 18 Sept. 1979; Austin DF, Santos MR, Rabelo B, Neuman CE, Rosário CS 7433 (UEC 20003) • Pará: Santarém, 1849, Spruce RSN (G00310786) • Pará: Oriximiná; 18 Aug. 2008; Oliveira DR de 128 (INPA 224625) • Pará: Santarém; 22 July 1982; Branch LC 188 (INPA 106350) • Pará: Santa Isabel do Pará Americano; 22 Jan. 1982; César HL 948 (EAC 13788) • Pará: Vicinity of Pará; 16 Dec. 1907; Baker CF 39 (P05484001) • Suriname: Mapane creek, near Blakawatra; 1 Aug. 1962; Boerboon J 9535 (U1262576) • Pará: Belém, Mar.–May 1929; Dahlgren BA, Sella E (US01320713) • Rondônia: E bank of Madeira River between Penha Colorado and Cachoeira Araras; 20 Nov. 1968; Prance GT 8694 (INPA 25493) • Rondônia: Madeira Falls; Oct. 1886; Rusby HH 894 (US32569) • Roraima: Alto Alegre, Maracá Ecological Station; field, stony soil; 25 Nov. 1978; Santos JL 348 (INPA 80407) • Guyana: NW district. Barabina Hill, 2





**Figure 2.** Morphological comparison among *Euphorbia thymifolia* and the other prostrate ruderal species of *Euphorbia* found in Brazil. **A, B.** *E. adenoptera*. **C, D.** *E. dioeca*. **E, F.** *E. prostrata*. **G, H.** *E. serpens*. **I, J.** *E. thymifolia*. Photos: O.L.M. Silva.

km SE of Mabaruma; cleared areas; Feb. 1992; Reinders MA 124 (NY542474).

## Discussion

*Euphorbia thymifolia*, as most ruderal species of *Euphorbia* in Brazil, is within *E.* sect. *Anisophyllum* and, amongst the Brazilian species of this section, it is morphologically similar to *E. adenoptera* Bertol., *E. dioeca* Kunth, *E. prostrata* Aiton, and *E. serpens* Kunth due to the shared prostrate growth form and occurrence in disturbed areas (Fig. 2). Many botanists are led to commonly misidentify these species, but despite their overall great similarity, these species may be distinguished on the basis of a large set of characteristics, such as the indumentum of vegetative and reproductive structures, especially the involucre of cyathial, pistillate flowers, fruits, and cyathial gland appendages (Silva et al. 2014).

Moreover, seeds are useful for the distinction of these species (Silva et al. 2016). It is noteworthy, however, that among all these species, *E. dioeca* Kunth is not

commonly found in Brazil. Therefore, specimens of *E. thymifolia* are rarely misidentified as *E. dioeca* and may be distinguished by having leaves lacking a central large dark blot, larger cyathial gland appendages, and styles not capitate at the apex (Table 2).

Among the specimens analyzed, one recorded for the state of Amazonas attracted our attention due to the indication on its label of latex use by the Makú people, in the Uneixi Indigenous Land, for the purpose of curing eye infection (US 2708630). The potential of latex from *E. thymifolia* seems to be confirmed, as laboratory tests showed its efficacy against the action of fungi and bacteria (Hussain et al. 2014). There are other indications of the plant in traditional medicine, with reported features like laxative, aromatic, sedation, blood purification, anti-viral, anti-helminthic, anti-inflammatory, anti-spasmodic, and diuretic properties (Kainsa and Singh 2016; Muthumani et al. 2016).

The record of *Euphorbia thymifolia* for the first time for Acre state revealed the need for further collection efforts in the Northern region, not only of such species,



**Table 2.** Morphological comparison among the most commonly found prostrate ruderal species of *Euphorbia* in Brazil.

|  | <i>E. adenoptera</i>  | <i>E. dioeca</i>  | <i>E. prostrata</i>                                    | <i>E. serpens</i>                | <i>E. thymifolia</i>                                      |
|--|---|---|--|----------------------------------|---|
| Leaf margin                              | Serrate to inconspicuously serrate  | Serrate   | Entire to inconspicuously serrate towards the apex     | Entire                           | Serrate   |
| Leaf indumentum                          | Glabrous or with a few sparse hairs   | Pilose to sparsely pubescent  | Glabrous or with a few sparse hairs along the margin   | Glabrous                         | Glabrous or with a few sparse hairs                       |
| Shape of the involucre of the cyathium   | Turbinate   | Turbinate   | Turbinate  | Campanulate                      | Turbinate   |
| Cyathial gland appendages                | Conspicuous, unequal in size (one pair larger than the other)               | Conspicuous, unequal in size (one pair larger than the other)           | Inconspicuous, equal in size                           | Inconspicuous, equal in size     | Absent or, if present, inconspicuous, and unequal in size |
| Perianth-like whorl in pistillate flower | Absent  | Absent  | Absent   | Absent or, if present, lacerate  | Absent  |
| Ovary/fruit indumentum                   | Puberulous  | Puberulous  | With two rows of trichomes along the keel of the cocci | Glabrous                         | Puberulous  |
| Styles                                   | Slender   | Slender   | Capitate   | Capitate                         | Capitate  |
| Pedice on fruit                          | Not accrescent, with the fruit exposed through an aperture in the involucre | Not accrescent, with fruit exposed through an aperture in the involucre | Accrescent   | Accrescent                       | Not accrescent, with fruit breaching the involucre        |
| Notes                                    | Appendages usually pinkish  | Appendages usually white; leaves with a central large dark blot         | Leaves usually with bluish tones                       | Frequently with rooting at nodes | Leaves usually with reddish tones                         |

but also of all the genus, whose specimens deposited in the reference herbaria are rare and old. Before this record, *E. thymifolia* was only known from the states of Amapá, Amazonas, and Pará (Lima et al. 1995; Ribeiro et al. 1999; Silva et al. 2014; Flora do Brasil 2020). This new record enhances the knowledge of the local flora and confirms gaps concerning ruderal species.

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Authors’ Contributions

MCS collected, identified, and wrote the original version of the manuscript. OLMS confirmed the species ID and also wrote part of the manuscript.

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